DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
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COMPUTER SCIENCE COLLOQUIUM

Efficient Recognition of Random Unsatisfiable k-SAT Instances by Spectral Methods

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The Seminar Room

Abstract: It is known that random k-SAT instances with at least dn clauses where $d = d_k$ is a suitable constant are unsatisfiable (with high probability). We consider the problem to certify efficiently the unsatisfiability of such formulas. A result of Beame et al. show that k-SAT instances with at least $n^{k-1}/\log(n)$ clauses can be certified unsatisfiable in polynomial time. We employ spectral methods to improve on this: We present a polynomial time algorithm which certifies random k-SAT instances with at least $2^k \cdot (k/2)^7 \cdot (ln(n))^7 \cdot n^{k/2}$ clauses as unsatisfiable (with high probability).

This is joint work with M. Krivelevich from Tel Aviv University.

Host: Klaus Meer